Our Reference: AC068 (ITT-482-A) PATENT

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Appellant:	James E. Ostrander et al.
Serial Number:	10/010,294
Filing Date:	November 12, 2001
Examiner/Art Group Unit:	D. Bochna/3679
Title:	FLUID QUICK CONNECTOR WITH SECURE ELECTRICAL CONTACT

APPEAL BRIEF

MAIL STOP AF
Commissioner for Patents
PO Box 1450
Alexandria, VA 22313-1450

Sir:

Please enter the following Appeal Brief in the Appeal filed December 19, 2003.

REAL PARTY IN INTEREST

The real party in interest is ITT Manufacturing Enterprises, Inc., by assignment from the inventors, James E. Ostrander et al.

RELATED APPEALS AND INTERFERENCES

None.

STATUS OF CLAIMS

Claims 1-27 are pending. No claim has been allowed. This is an appeal from the final rejection of claims 1-27.

STATUS OF AMENDMENTS

The amendment under 37 CFR 1.116, resubmitted on November 7, 2003, was not entered by the Patent Examiner.

SUMMARY OF THE INVENTION

The present invention is a fluid quick connector 16 (Figs. 1 and 5, paragraph 25) with an electrical contact 33 (Fig. 6, paragraph 47), 34 (Figs. 7-9, paragraph 30) which provides a secure electrical connection between a mated connector body 12 (Fig. 1, paragraph 25) and male endform 14 (Fig. 1, paragraph 25).

In one aspect, the fluid quick connector 16 is formed of a connector housing 12 having through bore adapted to mate with a male endform 14. A retainer 10 (Figs. 1-5, paragraphs 33, 34) locks the male endform 14 in the connector housing 12.

A seal assembly 30 (Fig 1, paragraph 31) includes at least one of an O-ring 31, a spacer 33 and/or a top hat 34 which are disposed in the bore of the connector housing to seal the male endform 14 to the connector body 12.

The electrical contact is provided in the quick connector 16 as a separate element in the bore of the connector housing 12, such as one of the spacer 33 or the top hat 34 to provide a secure electrical connection between the male endform and the connector housing 12 when the male endform 14 is mounted in the bore in the connector housing 12. The contact includes a contact member 35, 110 (Figs. 6-9, paragraphs 47-54) in the form of a radially inward extending projection carried on an inner surface of the separate element, such as the spacer 33 or the top hat 34, which is adapted to engage an outer surface of the male endform 14. Since the electrical contact is formed of an electrically conductive material and fixed in position in the connector housing 12, the electrical contact provides a secure electrical connection between the conductive male endform 14 and the conductive connector housing 12 to form an electrical path to dissipate static electric charge which may build up in the fuel system due to fluid flowing through aligned bores in the male endform and the connector body.

The contact member has at least one projection 35, 110 and, preferably, a plurality of circumferentially spaced projections carried or integrally formed on an inner surface of contact, such as on the spacer 33 or top hat 34. An inner end of each projection 35, 110 is disposed at a diameter with respect to the ends of other projections or the surrounding bore in the connector housing which is substantially equal to or slightly greater than the outer diameter of the tip end of the male endform 14. This insures secure contact between the contact member 35, 110 and the male endform 14.

The fluid quick connector 16 with the unique electrical contact 33, 34 of the present invention provides a secure electrically conductive path through the

quick connector to a remote ground which has heretofore not been continually available fluid in quick connectors. The conductive path is formed by contact members carried on or integrally formed on the contact, such as on the spacer or top hat components in the quick connector. This eliminates the need for additional components to provide the electrically conductive path between the male endform and the connector housing so as to minimize manufacturing costs. Further, the contact member is disposed so as to provide a wiping action when the male endform 14 is inserted into the bore in the connector housing 12 to provide the desired secure, continuous electrical contact between the male endform 14 and the surrounding connector housing 12. This conductive path finds advantageous use with conduits or multi-layer tubes having an inner electric charge dissipative layer. When such conduits or tubes are fixedly mounted on one end of the connector housing, the inner electric charge dissipative layer is disposed in contact with the conductive connector housing thereby insuring a continuous conductive pathway to ground through the male endform, the connector housing and the conduit or tube.

ISSUES ON APPEAL

The separate issues presented for review in this appeal are:

1. Whether claims 1, 11, 12, 19, and 23 are unpatentable under 35 USC §102(e) over Rose; and

2. Whether claims 2-10, 13-18, 20-22, and 24-27 are unpatentable under 35 USC §103(a) over Rose in view of Kot.

GROUPING OF CLAIMS

The claims do not stand or fall together. Claims 1, 11 and 23 are separately patentable from all other claims. Claims 2-5 and 24-27 are separately patentable from all other claims. Claims 10 and 12-15 are separately patentable from all other claims. Claims 6-9 and 16-18 are separately patentable from all other claims. Claims 19-22 are separately patentable from all other claims.

The specific reasons for the separate patentability of each group of claims is set forth in the following Argument Section of this Appeal Brief.

ARGUMENT

Claims 1, 11 and 23

Claims 1, 11 and 23 are rejected under 35 UCS §102(e) as being anticipated by Rose. The Examiner sets forth in the Office Action a list of elements of Rose which he considers to correspond to Appellants"s invention as set forth in claims 1, 11, and 23.

However, it is respectfully submitted that Rose lacks a retainer as set forth by the Appellants in claims 1 and 23. The tabs 9 appear to be formed as part of the housing and not as a separate element mounted in the housing to releasibly latch the endform in the housing. In Appellants' invention, the retainer is mounted in the housing. The electrical contact is separate from the retainer.

For these reasons, it is submitted that Rose fails to teach all of the features of Appellants' invention as set forth in claims 1 and 23, and claim 11 which depends from claim 1.

Claims 2-5 and 24-27

Claims 2-5 and 24-27 are rejected under 35 U.S.C. 35 U.S.C. §103(a) as being unpatentable over Rose in view of Kot. The Examiner notes that Rose does not disclose placing a plurality of radially inward extending projections on the O-ring. The Examiner cites Kot for placing four circumferentially spaced inward projections on a spacer which contact an endform under tension to increase the electrical contact between the mating components. From this, the Examiner concludes that it would have been obvious to one of ordinary skill in the art to modify the electrically contacting O-ring of Rose to include inwardly facing radial projections as taught by Kot in order to improve the electrical conductivity of Rose.

However, it is respectfully submitted that Appellants' invention as set forth in claims 2-5 and 24-27 includes features which are not suggested by any permissible combination of Rose and Kot.

Kot discloses an armored cable connector in which a watertight clad cable includes a helical wound metal conduit covered by a flexible plastic waterproof sheath. The waterproof sheath is stripped from an end of the inner metal conduit,

with the exposed end inserted into a connector housing into engagement with a split grounding collar formed of a metallic material which nests in the front end of the bore of the connector housing. A plurality of peripherally spaced resilient contact fingers project forwardly and radially inwardly from the rear edge of the collar to engage the exposed metal conduit.

However, it is respectfully submitted that the Examiner has not established *prima facie* case of obviousness to support a legitimate combination of Rose and Kot. Rose is directed to a fluid quick connector. Kot, on the other hand, is directed to an armored electrical cable. Kot requires that the outer plastic sheath be stripped from the end to expose the inner metal conduit to enable the split ring to contact the metal conduit in the connector housing.

It is respectfully submitted that one of ordinary skill in the art of fluid quick connectors would not be motivated by the teachings of Kot to apply a plurality of angularly disposed fingers on the O-ring of Rose since any further radially inward extending projections would make insertion of the endform through the O-ring in the connector housing much more difficult by increasing the insertion resistance. This is due to the nominally undersized inner diameter of the O-ring which is expanded by the slightly larger outer diameter of the endform when the endform is inserted through the O-ring in the bore in the housing. The interfering inner diameter of the O-ring and the outer diameter of the endform in Rose would negate any need to add additional radially inward extending projections as taught by Kot.

Further, the O-ring of Rose is formed of a resilient material. The split ring of Kot is necessarily formed of a metallic material so as to maintain the fingers at the desired angular position to provide tension and secure contact with the metal conduit. Making any additional inward extending projections on the resilient O-ring of Rose, as posed by the Examiner through the combination of Kot with Rose, would place the projections in the insertion path of the endform and significantly increase the insertion force resistance making a complete insertion of the endform into the bore in the housing through the O-ring more difficult and a fully sealed insertion uncertain. At the same time, the insertion of the endform through any such projections created on the O-ring of Rose would bend the projections out of the plane

of the O-ring and possibly negate the effectiveness of the projections since the O-ring is formed of a resilient material. As such, the use of such projections on the O-ring of Rose would be redundant and unnecessary.

For these reasons, it is respectfully submitted that the Examiner has not made a *prima facie* case of obviousness to support a combination of the teachings of Rose and Kot which would negate the patentability of Appellants' invention as set forth in claim 2-5 and 24-27.

This lack of legitimate combination is further evidenced by the different functions served by the O-ring of Rose and the rigid split collar of Kot. The two elements are different in structure and function so as to negate their combination as posed by the Examiner.

For the above reasons, it is respectfully submitted that Appellants' invention as set forth in claims 2-5 and 24-27 patentably defines over any permissible combination of Rose and Kot.

Claims 10, and 12-15

Claim 12 is rejected under 35 USC §102(e) as being anticipated by Rose. Claims 10 and 13-15 are rejected under 35 USC §103(a) as being unpatentable over Rose in view of Kot.

However, for the following reasons, it is respectfully submitted that Appellants' invention as set forth in claims 10 and 12-15 includes features which are not anticipated or rendered obvious by the cited references, taken singly or in any permissible combination.

In claims 10 and 12-15, Appellants' define the electrical contact as being formed as a spacer mounted in the bore with an O-ring seal.

Rose discloses a fuel-line coupling wherein the outer surface of a connector plug and the inner surface of a connector housing are lined with a conductive metallic layer. An electrically conductive O-ring seal member is mounted in a bore in the connector housing and engages the outer metallic surface of the plug when the plug is mounted in the housing to provide electrical contact between the plug and the housing.

However, the O-ring seal member of Rose is not a spacer as set forth by the Appellants' in claims 10 and 12. The spacer in Appellants' invention is a separate member employed with an O-ring seal similar to that of O-ring of Rose. The spacer is a completely different structural element from the O-ring seal of Rose. The spacer has a rigid construction as compared to the resilient sealing material used to form the O-ring of Rose. The ID of the O-ring of Rose is normally made slightly smaller than the OD of the plug so as to cause an expansion of the O-ring when the plug is inserted through the O-ring bringing the OD of the O-ring into engagement with the inner surface of the surrounding bore in the connector housing to provide a seal in the bore. There is no such radial expansion of the spacer in Appellants' invention. Thus, there is no teaching in Rose of at least one radially inward extending projection on an electrically conductive annular spacer as acknowledged by the Examiner in the following rejection.

For these reasons, it is respectfully submitted that Appellants' invention, set forth in claim 10 and 12-15, includes features which are not anticipated by Rose.

With respect to the projections in claims 10 and 13-15, the Examiner notes that Rose does not disclose radially inward extending projections on the O-ring. The Examiner cites Kot for placing four circumferentially spaced inward projections on a spacer which contact an endform under tension to increase the electrical contact between the mating components. From this, the Examiner concludes that it would have been obvious to one of ordinary skill in the art to modify the electrically contacting O-ring of Rose to include inwardly facing radial projections as taught by Kot in order to improve the electrical conductivity of Rose.

However, it is respectfully submitted that Appellants' invention as set forth in claims 10 and 13-15 includes features which are not suggested by any permissible combination of Rose and Kot as posed by the Examiner.

Kot discloses an armored cable connector in which a watertight clad cable includes a helical wound metal conduit covered by a flexible plastic waterproof sheath. The waterproof sheath is stripped from an end of the inner metal conduit, with the exposed end inserted into a connector housing into engagement with a split

grounding collar formed of a metallic material which nests in the front end of the bore of the connector housing. A plurality of peripherally spaced resilient contact fingers project forwardly and radially inwardly from the rear edge of the collar to engage the exposed metal conduit.

However, it is respectfully submitted that the Examiner has not established *prima facie* case of obviousness to support a legitimate combination of Rose and Kot. Rose is directed to a fluid quick connector. Kot, on the other hand, is directed to an armored electrical cable. Kot requires that the outer plastic sheath be stripped from the end to expose the inner metal conduit to enable the split ring to contact the metal conduit in the connector housing.

It is respectfully submitted that one of ordinary skill in the art of fluid quick connectors would not be motivated by the teachings of Kot to apply a plurality of angularly disposed fingers on the O-ring of Rose since any further radially inward extending projections would make insertion of the endform through the O-ring in the connector housing much more difficult by increasing the insertion resistance. This is due to the nominally undersized inner diameter of the O-ring which is expanded by the slightly larger outer diameter of the endform when the endform is inserted through the O-ring in the bore in the housing. The interfering inner diameter of the O-ring and the outer diameter of the endform in Rose would negate any need to add additional radially inward extending projections as taught by Kot.

Further, the O-ring of Rose is formed of a resilient material. The split ring of Kot is necessarily formed of a metallic material so as to maintain the fingers at the desired angular position to provide tension and secure contact with the metal conduit. Making any additional inward extending projections on the resilient O-ring of Rose, as posed by the Examiner through the combination of Kot with Rose, would place the projections in the insertion path of the endform and significantly increase the insertion force resistance making a complete insertion of the endform into the bore in the housing through the O-ring more difficult and a fully sealed insertion uncertain. At the same time, the insertion of the endform through any such projections created on the O-ring of Rose would bend the projections out of the plane of the O-ring and possibly negate the effectiveness of the projections since the O-ring

is formed of a resilient material. As such, the use of such projections on the O-ring of Rose would be redundant and unnecessary.

For these reasons, it is respectfully submitted that the Examiner has not made a *prima facie* case of obviousness to support a combination of the teachings of Rose and Kot to negate the patentability of Appellants' invention as set forth in claims 10 and 13-15.

This lack of legitimate combination is further evidenced by the different functions served by the O-ring of Rose and the rigid split collar of Kot. The two elements are different in structure and function so as to negate their combination as posed by the Examiner. Further, an O-ring is an entirely separate element in a fluid quick connector than the spacer.

For the above reasons, it is respectfully submitted that Appellants' invention as set forth in claims 10 and 13-15 patentably defines over any permissible combination of Rose and Kot.

Claims 6-9 and 16-18

Claims 6-9 and 16-18 are rejected under 35 USC § 103(a) as being unpatentable over Rose in view of Kot. The Examiner notes that Rose does not disclose placing a plurality of radially inward extending projections on the O-ring. The Examiner cites Kot for placing four circumferentially spaced inward projections on a spacer which contact an endform under tension to increase the electrical contact between the mating components. From this, the Examiner concludes that it would have been obvious to one of ordinary skill in the art to modify the electrically contacting O-ring of Rose to include inwardly facing radial projections as taught by Kot in order to improve the electrical conductivity of Rose.

However, it is respectfully submitted that Appellants' invention as set forth in claims 6-9, and 16-18 includes features which are not suggested by any permissible combination of Rose and Kot as posed by the Examiner.

Kot discloses an armored cable connector in which a watertight clad cable includes a helical wound metal conduit covered by a flexible plastic waterproof sheath. The waterproof sheath is stripped from an end of the inner metal conduit,

with the exposed end inserted into a connector housing into engagement with a split grounding collar formed of a metallic material which nests in the front end of the bore of the connector housing. A plurality of peripherally spaced resilient contact fingers project forwardly and radially inwardly from the rear edge of the collar to engage the exposed metal conduit.

However, it is respectfully submitted that the Examiner has not established *prima facie* case of obviousness to support a legitimate combination of Rose and Kot. Rose is directed to a fluid quick connector. Kot, on the other hand, is directed to an armored electrical cable. Kot requires that the outer plastic sheath be stripped from the end to expose the inner metal conduit to enable the split ring to contact the metal conduit in the connector housing.

It is respectfully submitted that one of ordinary skill in the art of fluid quick connectors would not be motivated by the teachings of Kot to apply a plurality of angularly disposed fingers on the O-ring of Rose since any further radially inward extending projections would make insertion of the endform through the O-ring in the connector housing much more difficult by increasing the insertion resistance. This is due to the nominally undersized inner diameter of the O-ring which is expanded by the slightly larger outer diameter of the endform when the endform is inserted through the O-ring in the bore in the housing. The interfering inner diameter of the O-ring and the outer diameter of the endform in Rose would negate any need to add additional radially inward extending projections as taught by Kot.

Further, the O-ring of Rose is formed of a resilient material. The split ring of Kot is necessarily formed of a metallic material so as to maintain the fingers at the desired angular position to provide tension and secure contact with the metal conduit. Making any additional inward extending projections on the resilient O-ring of Rose, as posed by the Examiner through the combination of Kot with Rose, would place the projections in the insertion path of the endform and significantly increase the insertion force resistance making a complete insertion of the endform into the bore in the housing through the O-ring more difficult and a fully sealed insertion uncertain. At the same time, the insertion of the endform through any such projections created on the O-ring of Rose would bend the projections out of the plane

of the O-ring and possibly negate the effectiveness of the projections since the O-ring is formed of a resilient material. As such, the use of such projections on the O-ring of Rose would be redundant and unnecessary.

For these reasons, it is respectfully submitted that the Examiner has not made a *prima facie* case of obviousness to support a permissible combination of the teachings of Rose and Kot to negate the patentability of Appellants' invention as set forth in claims 6-9 and 16-18.

This lack of legitimate combination is further evidenced by the different functions and structure of the O-ring seal of Rose and the rigid split collar of Kot. Further, the O-ring of Rose is an entirely separate element from a top hat in a fluid quick connector.

For the above reasons, it is respectfully submitted that Appellants' invention as set forth in claims 6-9 and 16-18 patentably defines over any permissible combination of Rose and Kot.

Claims 19-22

Claims 19-22 are rejected under 35 USC §102(e) as being anticipated by Rose and, also, under 35 USC §103(a) as being unpatentable over Rose in view of Kot. The Examiner notes that Rose does not disclose placing a plurality of radially inward extending projections on the O-ring. The Examiner cites Kot for placing four circumferentially spaced inward projections on a spacer which contact an endform under tension to increase the electrical contact between the mating components. From this, the Examiner concludes that it would have been obvious to one of ordinary skill in the art to modify the electrically contacting O-ring of Rose to include inwardly facing radial projections as taught by Kot in order to improve the electrical conductivity of Rose.

However, it is respectfully submitted that Appellants' invention as set forth in claims 19-22 includes features which are not suggested by any permissible combination of Rose and Kot as posed by the Examiner.

With respect to the rejection of claim 19 under 35 USC §102 over Rose, Rose discloses a fuel-line coupling wherein the outer surface of a connector

plug and the inner surface of a connector housing are lined with a conductive metallic layer. An electrically conductive O-ring seal member is mounted in a bore in the connector housing and engages the outer metallic surface of the plug when the plug is mounted in the housing to provide electrical contact between the plug and the housing.

However, the O-ring seal member of Rose is not a top hat as set forth by the Appellants in independent claim 19. The top hat in Appellants' invention is a separate member employed with an O-ring seal similar to the O-ring of Rose. The top hat is a completely different structural element from the O-ring seal of Rose. The top hat has a rigid construction as compared to the resilient sealing material used to form the O-ring of Rose. Since the ID of the O-ring of Rose is normally made slightly smaller than the OD of the plug so as to cause an expansion of the O-ring when the plug is inserted through the O-ring bringing the OD of the O-ring into engagement with the inner surface of the surrounding bore in the connector housing to provide a seal in the bore, there is no teaching in Rose of at least one radially inward extending projection on an electrically conductive annular body as acknowledged by the Examiner in the following rejection.

For these reasons, it is respectfully submitted that Appellants' invention, set forth in claims 19-22, includes features which are not anticipated by Rose.

Kot discloses an armored cable connector in which a watertight clad cable includes a helical wound metal conduit covered by a flexible plastic waterproof sheath. The waterproof sheath is stripped from an end of the inner metal conduit, with the exposed end inserted into a connector housing into engagement with a split grounding collar formed of a metallic material which nests in the front end of the bore of the connector housing. A plurality of peripherally spaced resilient contact fingers project forwardly and radially inwardly from the rear edge of the collar to engage the exposed metal conduit.

However, it is respectfully submitted that the Examiner has not established *prima facie* case of obviousness to support a legitimate combination of Rose and Kot. Rose is directed to a fluid quick connector. Kot, on the other hand, is

directed to an armored electrical cable. Kot requires that the outer plastic sheath be stripped from the end to expose the inner metal conduit to enable the split ring to contact the metal conduit in the connector housing.

It is respectfully submitted that one of ordinary skill in the art of fluid quick connectors would not be motivated by the teachings of Kot to apply a plurality of angularly disposed fingers on the O-ring of Rose since any further radially inward extending projections would make insertion of the endform through the O-ring in the connector housing much more difficult by increasing the insertion resistance. This is due to the nominally undersized inner diameter of the O-ring which is expanded by the slightly larger outer diameter of the endform when the endform is inserted through the O-ring in the bore in the housing. The interfering inner diameter of the O-ring and the outer diameter of the endform in Rose would negate any need to add additional radially inward extending projections as taught by Kot.

Further, the O-ring of Rose is formed of a resilient material. The split ring of Kot is necessarily formed of a metallic material so as to maintain the fingers at the desired angular position to provide tension and secure contact with the metal conduit. Making any additional inward extending projections on the resilient O-ring of Rose, as posed by the Examiner through the combination of Kot with Rose, would place the projections in the insertion path of the endform and significantly increase the insertion force resistance making a complete insertion of the endform into the bore in the housing through the O-ring more difficult and a fully sealed insertion uncertain. At the same time, the insertion of the endform through any such projections created on the O-ring of Rose would bend the projections out of the plane of the O-ring and possibly negate the effectiveness of the projections since the O-ring is formed of a resilient material. As such, the use of such projections on the O-ring of Rose would be redundant and unnecessary.

For these reasons, it is respectfully submitted that the Examiner has not made a *prima facie* case of obviousness to support a permissible combination of the teachings of Rose and Kot to negate the patentability of Appellants' invention as set forth in claims 19-22.

This lack of legitimate combination is further evidenced by the different functions and structure of the O-ring seal of Rose and the rigid split collar of Kot. The O-ring of Rose is not a spacer or a top hat in a fluid quick connector.

For the above reasons, it is respectfully submitted that Appellants' invention as set forth in claims 19-22 patentably defines over any permissible combination of Rose and Kot.

CONCLUSION

For the reasons stated above, it is respectfully submitted that Appellants' invention as set forth in claims 1-27 patentably defines over the cited references and is not anticipated or rendered obvious thereby. As such, it is respectfully submitted that the Examiner's final rejection of claims 1-27 is erroneously based and its reversal is respectfully requested.

No oral hearing is requested.

Appellants' attorney's check in the amount of $330.00 is enclosed to cover the Appeal Brief filing fee.

This Appeal Brief is being filed in triplicate including one original and two copies.

Respectfully submitted,

YOUNG, BASILE, HANLON, MacFARLANE, WOOD & HELMHOLDT, P.C.

William M. Hanlon, Jr.
Attorney for Appellant(s)
Registration No. 28422
(248) 649-3333

3001 West Big Beaver Rd., Suite 624
Troy, Michigan 48084-3107

Dated: February 17, 2004
WMH/jao

APPENDIX A

1. (Previously Presented) A fluid quick connector comprising:

a connector housing configured to receive an endform;

a retainer mounted in the connector housing to releasibly latch the endform in the connector housing; and

an electrical contact mounted separately from the retainer in the connector housing between the housing and the endform for establishing electrical contact between an outer surface of endform and the connector housing, the electrical contact including an electrically conductive annular body having an outer diameter disposing the body in contact with an inner diameter of the bore in the connector housing, and at least one radially inward extending projection carried on the body adapted to engage the male endform when the endform is mounted in the bore in the connector housing.

2. (Previously Presented) The fluid quick connector of claim 1 wherein the electrical contact comprises:

an electrically conductive annular body having an outer diameter disposing the body in contact with an inner diameter of the bore in the connector housing; and

at least one radially inward extending projection carried on the body adapted to engage the male endform when the endform is mounted in the bore in the connector housing.

3. (Previously Presented) The fluid quick connector of claim 1 wherein:

the at least one projection comprises a plurality of circumferentially spaced projections.

4. (Original) The fluid quick connector of claim 3 wherein:

the plurality of circumferentially spaced projections comprises at least three projections.

5. (Previously Presented) The fluid quick connector of claim 4 wherein the plurality of projections are equi-circumferentially spaced about an inner surface of the annular body.

6. (Previously Presented) The fluid quick connector of claim 1 wherein the annular body comprises:

an electrically conductive top hat mountable in a bore of the connector housing for holding a seal element in the bore, the top hat having an inner bore receiving the endform; and

the at least one radially inward extending projection carried on the top hat adapted to engage the endform when the endform is inserted into the bore in the connector housing.

7. (Original) The fluid quick connector of claim 6 wherein:

the at least one projection comprises a plurality of circumferentially spaced projections.

8. (Original) The fluid quick connector of claim 7 wherein:

the plurality of circumferentially spaced projections comprises at least three projections.

9. (Original) The fluid quick connector of claim 7 wherein the plurality of projections are equi-circumferentially spaced about an inner surface of the top hat.

10. (Previously Presented) The fluid quick connector of claim 1 wherein the annular body comprises:

a spacer mounted in the bore about the endform; and

at least one radially inward extending projection carried on the spacer adapted to engage the endform when the endform is inserted into the bore in the connector housing.

11. (Original) The fluid quick connector of claim 1 further comprising:

the connector housing and the endform being electrically conductive.

12. (Previously Presented) A fluid quick connector comprising:

a connector housing configured to receive an endform;

a retainer mounted in the connector housing to releasibly latch the endform in the connector housing;

a spacer, the spacer mounted in a through bore of the connector housing between the male endform and the connector housing; and

an electrical contact member carried on the spacer for establishing electrical contact between the endform and the connector housing, the contact member including the spacer formed of an electrically conductive material, and at least one radially inward projection carried on the spacer adapted to engage the endform where the endform is mounted in the bore in the connector housing.

13. (Previously Presented) The fluid quick connector of claim 12 wherein the contact member comprises:

the spacer formed of an electrically conductive material; and

at least one radially inward projection carried on the spacer adapted to engage the endform where the endform is mounted in the bore in the connector housing.

14. (Previously Presented) The fluid quick connector of claim 12 wherein:

the at least one projection comprises a plurality of circumferentially spaced projections.

15. (Previously Presented) The fluid quick connector of claim 14 wherein:

the plurality of circumferentially spaced projections comprises at least three projections.

16. (Previously Presented) A fluid quick connector comprising:

an electrically conductive connector housing configured to receive an electrically conductive endform

a retainer mounted in the connector housing to releasibly latch the endform in the connector housing;

a top hat separate from the retainer, the top hat mountable in a bore of the connector housing for holding a seal element in the bore, the top hat receiving the endform therethrough, the top hat formed of an electrically conductive material; and

an electrical contact member defining at least one radially inward extending projection carried on the top hat adapted to engage the endform when the endform is inserted into the bore in the connector housing.

17. (Original) The fluid quick connector of claim 16 wherein:

the at least one projection comprises a plurality of circumferentially spaced projections.

18. (Original) The fluid quick connector of claim 16 wherein:

the plurality of projections comprises three circumferentially spaced projections.

19. (Previously Presented) A fluid quick connector comprising:

a connector housing configured to receive an endform along a first axis;

the connector housing and the endform being electrically conductive;

a retainer mounted in the connector housing to releasibly latch the endform in the connector housing;

a spacer and a top hat disposed in a through bore in the connector housing about the endform and separate from the retainer; and

an electrical contact member carried on one of the spacer and the top hat for establishing electrical contact between the endform and the connector housing, the electrical contact member including at least one of the spacer and the top hat formed of an electrically conductive material, and at least one radially inward projection carried on the spacer and the top hat adapted to engage the endform where the endform is mounted in the bore in the connector housing.

20. (Previously Presented) A fluid quick connector comprising:

a connector housing configured to receive an endform along a first axis;

the connector housing and the endform being electrically conductive;

a retainer mounted in the connector housing to releasibly latch the endform in the connector housing;

a spacer and a top hat disposed in a through bore in the connector housing about the endform and separate from the retainer; and

an electrical contact member carried on one of the spacer and the top hat for establishing electrical contact between the endform and the connector housing.

21. (Previously Presented) The fluid quick connector of claim 19 wherein:

the at least one projection comprises a plurality of circumferentially spaced projections.

22. (Original) The fluid quick connector of claim 21 wherein:

the plurality of circumferentially spaced projections comprises at least three projections.

23. (Previously Presented) An electrical contact for a fluid quick connector having a connector housing configured to receive an endform latched in the housing by a retainer, the electrical contact comprising:

an electrically conductive body adapted to be disposed in a bore of a connector housing axially separate from the retainer about an endform inserted into the housing to establish electrical contact between the endform and the connector housing, the electrically conductive body having an outer diameter disposing the body in contact with an inner diameter of the bore in the connector housing, and at least one radially extending contact projection carried on the body adapted to engage the endform where the endform is mounted in the bore in the connector housing.

24. (Previously Presented) The electrical contact of claim 23 further comprising:

the electrically conductive body having an outer diameter disposing the body in contact with an inner diameter of the bore in the connector housing; and

at least one radially extending contact projection carried on the body adapted to engage the endform where the endform is mounted in the bore in the connector housing.

25. (Previously Presented) The electrical contact of claim 23 wherein:

the at least one contact projection comprises a plurality of circumferentially spaced contact projections.

26. (Original) The electrical contact of claim 25 wherein:

the plurality of circumferentially spaced contact projections comprises at least three contact projections.

27. (Original) The electrical contact of claim 25 wherein the plurality of contact projections are equi-circumferentially spaced about an inner surface of the contact body.

APPENDIX B

FINAL REJECTION

Claims 1, 11, 12, 19, and 23 are rejected under 35 USC §102(e) as being anticipated by Rose et al.

In regard to claim 1, Rose et al. discloses a fluid quick connector comprising:

a connector housing 1 configured to receive an endform 3;

a retainer 9 mounted in the connector housing to releasbly latch the endform in the connector housing; and

an electrical contact 5, 6, (collar holding 6 in the bore) mounted separately from the retainer 9 in the connector housing between the housing 1 and the endform 3 for establishing electrical contact between an outer surface of the endform 3 and the connector housing 1.

In regard to claim 11, the connector housing 1 and the endform 3 being electrically conductive (via coating 5).

In regard to claim 12, Rose et al. discloses a connector housing 1 configured to receive an endform 3;

a retainer 9 mounted in the connector housing to releasably latch the endform 3 in the connector housing 1;

a spacer (cylinder between 2 and 6 holding 6 in place), the spacer mounted in a through bore of the connector housing between the male endform 3 and the connector housing 1; and

an electrical contact member 5 carried on the spacer (cylinder holding 6 in place)(see column 2, lines 45-51) for establishing electrical contact between the endform and the connector housing.

In regard to claim 19, Rose et al. discloses a connector housing 1 configured to receive an endform 3 along a first axis;

the connector housing 1 and the endform 3 being electrically conductive;

a retainer 9 mounted in the connector housing to releasably latch the endform 3 in the connector housing;

a spacer 6 and a top hat (cylinder holding 6 in the 1) disposed in a through bore in the connector housing about the endform and separate from the retainer; and

an electrical contact member (6 is made of a conductive material) carried on one of the spacer and the top hat for establishing electrical contact between the endform and the connector housing.

In regard to claim 23, Rose et al. discloses an electrical contact for a fluid quick connector having a connector housing 1 configured to receive an endform 3 latched in the housing 1 by a retainer 9, the electrical contact comprising:

an electrically conductive body 6 adapted to be disposed in a bore of a connector housing axially separate from the retainer 9 about an endform inserted into the housing to establish electrical contact between the endform and the connector housing.

Claims 2-10, 13-18, 20-22 and 24-27 are rejected under 35 USC §103(a) as being unpatentable over Rose et al. in view of Kot et al. Rose et al. discloses a fluid quick connect as described above. Rose et al. also discloses coating all of the connection components (see column 2, lines 43-44), including the O-ring, with a conductive material in order to assure that a good electrical connection is made between the mating components. However, Rose et al. does not disclose placing a plurality of radially inward extending projections on the spacer 6 or the top hat (cylinder holding 6 in the bore). Kot et al. teaches placing four circumferentially spaced inward projections 51 on a spacer 21 which contact an endform under tension (see column 3, lines 45-49) in order to increase the electrical contact between the mating components 24, 13. Therefore it would have been obvious to one having ordinary skill in the art, at the time the invention was made, to modify the electrically contacting spacer 6 or top hat (cylinder holding 6 in the bore) of Rose et al. to include inwardly facing radially projections, as taught by Kot et al. in order to improve on the electrical conductivity that Rose et al. wished to achieve.